switched mains output for ATX

Design by K. Walraven

Current personal computers with an ATX motherboard are not provided with a switched mains output socket. It is therefore no longer possible to achieve automatic switching on or off of peripheral units with the computer on/off switch. This is not such a problem when switching on, because it is quickly seen when a peripheral unit is on or not. However, overlooking switching off at the end of the day or working session leads to needless energy consumption an possible shortening of life of the peripheral unit. It is, fortunately, simple to do something about this.

An ATX motherboard contains all logic circuits for implementing a USB port. Peripheral equipment that may be connected to this bus may draw a current of up to 100 mA from it, and a total of not more than 500 mA for all units together. This means that the USB port may be used without any difficulties to energise a relay. This relay in turn makes it possible to switch peripheral units on and off in tandem with the computer.

When there is a potential at the USB interface, relay Re1 is energised via diode D2. The relay contact closes and the peripheral units are powered. Capacitor C1 buffers any irregularities on the USB potential so that a brief dip in this does not immediately lead to the relay being de-energised. Diode D1 is a free-wheeling device for the relay coil.

The design of the USB port is well thought out. There are two types of connector around. Downstream, that is, from computer to peripheral unit, a square one (Type A) is used, whereas upstream, that is, from peripheral unit to computer, a flat one (Type B) is used. By terminating each cable with a Type A and a Type B connector, connecting errors, such as those frequently encountered with RS-232 and DIN cables, are all but impossible. The cables are always terminated into plugs, whereas the equipment is fitted with sockets.

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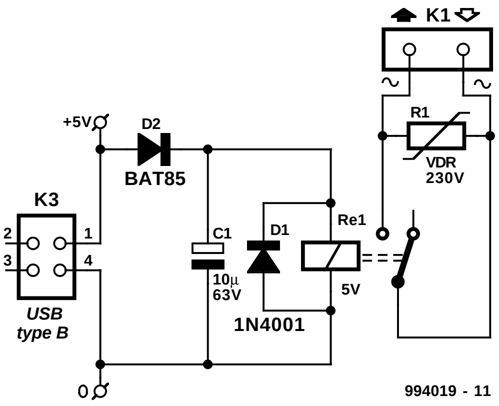

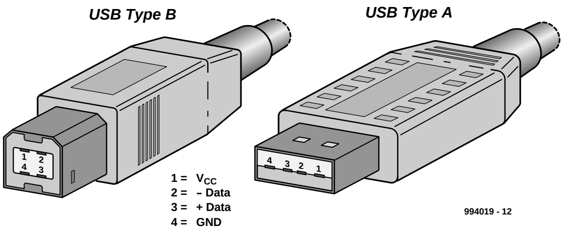

COMPONENTS LIST

Resistor:
R1 = voltage-dependent resistor (VDR), 230/250V

Capacitor:
C1 = 10µF 63V

Semiconductors:
D1 = 1N4001
D2 =BAT85

Miscellaneous:
Re1 = Siemens E-card relay, 5V, PCB mount
K1 = 2-way PCB terminal block, pitch 7.5mm
K3 = USB socket, panel mounting, Type B